PSYCHE

A JOURNAL OF ENTOMOLOGY

ESTABLISHED IN 1874

VOL. 55 JUNE, 1948 No. 2

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A regular meeting of the Club is held on the second Tuesday of each month (July, August and September, excepted) at 8:00 p.m. in Room B–455, Biological Laboratories, Divinity Ave., Cambridge. Entomologists visiting Boston are cordially invited to attend.

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PSYCHE

VOL. 55 JUNE, 1948 NO. 2

LEPTINUS AMERICANUS LECONTE TAKEN ON A SHREW (COLEOPTERA-LEPTINIDÆ)

BY F. G. WERNER AND R. L. EDWARDS

Biological Laboratories, Harvard University

A fairly extensive literature has developed on the curious "mammal nest beetles" and their relationship with their hosts. Several cases have been recorded of beetles actually being taken in the fur of mammals and it is hoped that with the accumulation of data the significance of this occurence will become apparent.

One of the authors, Edwards, has taken these beetles several times in the fur of a shrew, *Blarina brevicauda talpoides* (Gapper). The animals had been caught in live-traps and the beetles were on them when they were examined for ectoparasites. The actual records are as follows: 2 ♀♀, 9-Mile Swamp, Hubbardsville, N. Y., 1 in Nov. and 1 in Dec., 1946; 1 ♂, 1 ♀, Lake Piseco, N. Y., May 3, 1947; 1 ♂, Murphy Woods, Hamilton, N. Y., June 3, 1947. No specimens were taken in the nests.

Mr. H. S. Barber, of the U.S.D.A. Division of Insect Identification, suggests that this is a case of phoresy, with the primary source of the beetles being the nest of another mammal, whose burrows the shrews had invaded. He gives three cases, in litt., where large numbers have been taken in the nests of moles and one in the nest of a bumblebee. Dury, 1892, tells of getting 107 specimens in a nest in which he had captured a specimen of *Blarina brevicauda*. The caption of his article is "What I found in the Nest of a Field Mouse" so there is some doubt as to the actual identity of the nest. Numerous European references to *Leptinus* mention mice, moles and shrews.

Others mention finding them in caves. As will be pointed out below, these do not refer to the same species as our *Leptinus*.

When the specimens were checked by Werner, the other author, it was discovered that there were significant differences between the series at hand and the specimens used in the figures of the European species by Jeannel and by Sharp and Muir. This led to closer examination. There is little if any difference in general appearance. The only discernible differences were the wider eighth antennal segment, which was narrower than the adjacent segments in *testaceus*, and the slightly wider clypeus. When the male genitalia were examined, it was found that great disparity exists. Our species has the parameres wider and with eight apical setæ in addition to the two long subapical setæ. Both Jeannel's and Sharp and Muir's figures of the male genitalia show only two long subapical setæ and some differences in general shape and proportion. Jeannel figures the tips of the mandibles as simple, while our species has the tips bifid. Two specimens dissected by Mr. Barber and kindly loaned for comparison, one from Barèges, Pyrénées, France, and the other from Torrington, England, have genitalic characters as in the figures of Sharp and Muir and of Jeannel. The mandibles of these specimens were not examined as this would entail further dissection of the specimens and placing the mandibles on a slide.

Since major differences in the genitalia usually are taxonomically significant, our *Leptinus* is surely different from *Leptinus testaceus* (Müll.). *Leptinus americanus* LeConte was described from Iowa. Unfortun-

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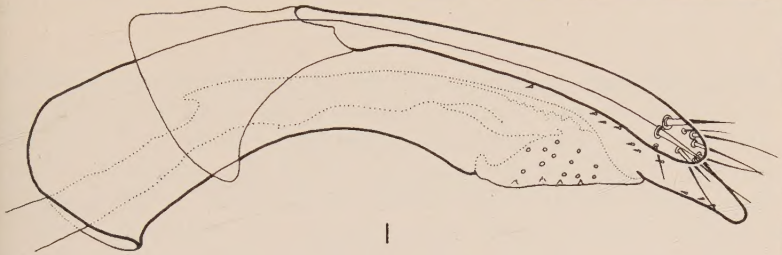
Explanation of Plate 8

Leptinus americanus Lec.

Camera lucida drawings of New York specimens mentioned in the text. Figs. 3–5 from cleared specimens on slides, 1 & 2 from dissection of an alcoholic specimen. All deposited in M.C.Z.

Fig. 1. Male genitalia, left lateral view, 238 ×.
Fig. 2. Male genitalia, dorsal view, 238 ×.
Fig. 3. Right antenna of female, dorsal view, 49 ×.
Fig. 4. Dorsal view of head of female, 49 ×.
Fig. 5. Tip of left mandible, ventral view, 382 ×.



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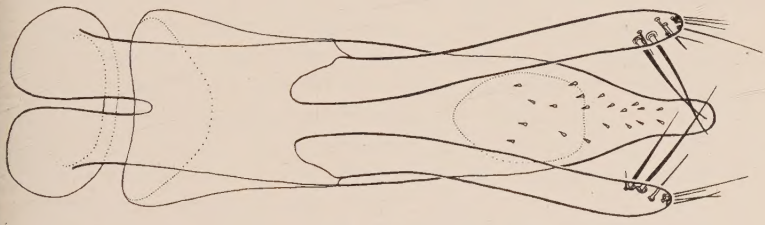

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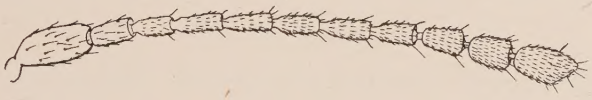

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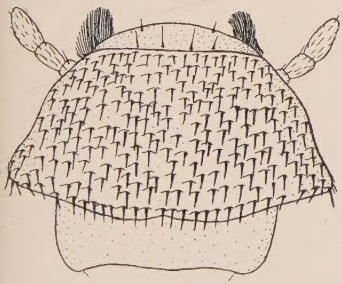

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WERNER AND EDWARDS—LEPTINUS AMERICANUS

ately, all four specimens in the type series are females so that no check could be made of the male genitalia but the external characters check perfectly with the New York series. Undoubtedly, most or all of the specimens from eastern North America should be assigned to this species.

References

Dury, C. 1892. Jour. Cincinnati N. H. Soc., 14: 183.
Jeannel, R. 1922. Arch. Zool. Exp. et Gen. 60: 557.
LeConte, J. L. 1866. Proc. Acad. Nat. Sci. Phila. 1866: 367.
Sharp, D., and Muir, F. 1912. Trans. Ent. Soc. London, 1912: 506, pl. 51, fig. 55, 55a.

SOME SPIDERS FROM ACAPULCO, MEXICO*

By Elizabeth B. Bryant
Museum of Comparative Zoölogy

The Museum of Comparative Zoölogy has recently received two small collections of spiders made at Acapulco, by Dr. Harriet E. Frizzell in September 1940, of 4 species and a larger collection of 31 species by Dr. Sarah E. Jones taken in December 1944. Of these 35 species, 8 and an allotype are new. All of these are small and easily overlooked by the casual collector. It is a locality from which the Cambridges had little material when they wrote the two volumes of the Biologia Centrali-Americana, published in 1889–1905. In a short paper by Dr. W. J. Gertsch in 1907, several species from this locality were included but all were collected at a different season of the year.

The following is a list of the species found. All were collected in December with the exception of the four marked September.

Family Œcobiidæ

♂ ♀ *Œcobius beatus* Gertsch and Davis

Family Lycosidæ

♂ ♀ pullus *Sosippus mexicanus* Simon, Sept.

Family Sicariidae

pullus *Scytodes championi* F.O.P.-Cambr.
♀ " *hebraica* Simon

Family Pholcidæ

♂ ♀ *Physocylus globosus* (Tacz.)

Family Dictynidæ

♀ *Dictyna sp.*
♀ " *nivea* (O.P.-Cambr.)

*Published with a grant from the Museum of Comparative Zoölogy at Harvard College.

Family Theridiidæ

♀ *Latrodectus mactans* (Fabr.)
♀ *Theridion maculipes* spec. nov.
♀ " *placidum* spec. nov.

Family Linyphiidæ

♀ *Eperigone* ?

Family Argiopidæ

♂ pullus *Argiope* sp. Sept.
♂ ♀ *Aranea pallidulus* (Keys.)
♂ ♀ " *vesta* spec. nov.
♀ *Eriophora edax* (O.P.-Cambr.)
♀ *Neosconella lineatipes* (O.P.-Cambr.)
♂ ♀ " *oaxacensis* (Keys.) Sept.
♂ *Tetragnatha alba* F.O.P.-Cambr.
♂ ♀ " *antillana* Simon
♂ ♀ " *dentigera* F.O.P.-Cambr.
♂ ♀ " *guatemalensis* O.P.-Cambr.
♀ pullus *Theridiosoma* ?

Family Thomisidæ

♂ *Misumenops celer* (Hentz)
2 ♂ ♀ pullus *Misumenops dubius* (Keys.)

Family Clubionidæ

♀ pullus *Anyphæna*
♀ *Anyphænella pavida* spec. nov.

Family Salticidæ

♂ ♀ *Habronattus cambridgei* spec. nov.
♀ *Marpissa melanognatha* (Lucas)
♂ ♀ *Metaphidippus gratus* spec. nov.
♂ " *militaris* (Hentz)
♂ ♀ " *purus* spec. nov.
♀ *Phiale simplicicava* (F.O.P.-Cambr.)
♀ *Plexippus fannæ* (Peckham)
♀ *Sidusa* ?
♂ *Tomis jonesæ* spec. nov.

Family Œcobiidæ
Genus *Œcobius* Lucas 1845
Œcobius beatus Gertsch and Davis
Figures 1, 2

Œcobius beatus Gertsch and Davis, 1937, p. 2, figs. 1, 2. "♀ holotype and immature paratypes from Acapulco, Mexico, June 17, 1936 (L. I. Davis)."

Male. Length, 1.5 mm.

The male is much darker than the holotype but the amount of color evidently depends upon the habitat. The eyes are more closely grouped than in the female and are on a low turret. The two black annulæ on each joint of the legs are reduced to large lateral dots. The abdominal markings are typical of the genus and are very distinct.

The palpus is large for the size of the spider. There are three conspicuous points all protruding from the cavity, a forked pair in the distal half and a longer point at the base. All are heavily chitinized.

Allotype ♂ Mexico; Acapulco, 19 December 1944 (S. Jones). 3♂ 5♀ Mexico; Acapulco, 18–19 December 1944 (S. Jones).

The male selected as an allotype was found under a rock and has the dark marks on the cephalothorax and the abdomen much more distinct than the specimens found at the base of palm leaves, these are quite pale.

Family Theridiidæ
Genus *Theridion* Walckenaer 1805
Theridion maculipes spec. nov.
Figure 3

Female. Length, 1.5 mm., ceph. 0.6 mm., abd. 1.1 mm. long, 1.0 mm. wide.

Cephalothorax pale, little darker about the eye area, anterior margin only slightly narrowed, cephalic portion little higher than the thoracic; *eyes* cover the anterior margin, anterior row recurved, a.m.e. dark, convex, separated by less than a diameter, a.l.e. smaller than a.m.e., separated from them by a radius of a.m.e., posterior

row straight, eyes surrounded by red rings, p.m.e. larger than a.m.e., separated by less than a diameter, p.l.e. separated from p.m.e. by about a diameter of p.l.e., lateral eyes touching, p.l.e. larger than a.l.e.; *quadrangle* slightly higher than wide and about the same width in front as behind; *clypeus* higher than quadrangle; *mandibles* vertical, pale brown; *labium* dark, fused to the sternum, wider than long; *maxillæ* pale, more than twice as long as the labium, slightly inclined; *sternum* white, triangular, about as wide as long, ending in a truncate lobe between the fourth coxæ which are separated by fully a diameter; *abdomen* globose, pale, with no definite pattern, a small white inverted V at the base surrounded by black that quickly fades, dorsum with small chitinized dots that may be the bases of colorless hairs, venter a dull brown with an irregular median white spot; *legs* relatively short, 1–2–4–3, II left missing, white with broken dark rings at the tips of tibiae and metatarsi, no spines but rows of colorless hairs, most conspicuous on the anterior tarsi and metatarsi; *epigynum*, a pair of heavily chitinized round openings just above the fold that touch on the median line with larger and more widely separated sacs beneath the surface just anterior.

Holotype ♀ Mexico; Acapulco, 19 December 1944 (S. Jones).

Theridion maculipes is very small even for a *Theridion*. The most conspicuous characters are the white legs with the black dots and the black inverted V at the base of the abdomen. The openings of the epigynum are very distinct.

Theridion placidum spec. nov.

Figure 5

Female. Length, 2.6 mm., ceph. 0.9 mm., abd. 1.6 mm. long, 1.5 mm. wide.

Cephalothorax pale, cephalic portion slightly darker, shining, no hairs; *eyes* cover the anterior margin, anterior row slightly recurved, a.m.e. dark, separated by less than a diameter, convex, a.l.e. smaller than a.m.e., separated from them by about a radius of a.m.e., pos-

terior row procurved, p.m.e. larger than a.m.e., separated by less than a diameter, p.l.e. separated from p.m.e. by a diameter of p.m.e., lateral eyes touching, p.l.e. slightly larger than a.l.e.; *quadrangle* higher than wide, same width in front as behind; *clypeus* vertical, and higher than quadrangle; *mandibles* vertical, pale, cone-shaped; *labium* pale; *maxillæ* twice as long as labium; *abdomen* globose, with a narrow median dark stripe with wavering margins outlined with a narrow pale stripe each side, in the emarginations a dark spot, three pairs in all, sides a dull tan, entire abdomen with scattered colorless hairs, venter pale; legs, 1–2–4–3, and I and II right legs missing, I pair much the longest, pale, femora and tibiæ slightly darker at the tips, rows of colorless hairs; *epigynum,* a pair of small dark circular sacs, fully two diameters above the fold, separated by a diameter and a half, with small oval openings beneath as figured.

Holotype ♀ Mexico; Acapulco, 19 December 1944 (S. Jones).

Undoubtedly *Theridion placidum* has been confused with *Theridion spiralis* Emerton. The latter is a common species in the northern part of the United States and has been reported by Keyserling from Venezuela and by Banks from Teapic, Mexico. Unfortunately a specimen of the Banks identification is not in the museum collection. A type specimen of *Theridion spiralis* Emerton from Essex, Massachusetts, which is now before me, has the median stripe on the abdomen pale, heavily outlined by a dark stripe; the epigynum is separated from the fold by less than a diameter and the lower margin of the area is chitinized and rolled outward.

Family Argiopidæ

Genus *Aranea* Linnæus 1756

Aranea pallidula (Keys.)

Epeira pallidula Keyserling, 1863, p. 124, pl. 4, figs. 14, 15. "♀ St. Fè de Bogota (N. Granada)."

Araneus pallidulus F.O.P.-Cambridge, 1904, 2, p. 514, pl. 49, fig. 13.

Keyserling described this species from a single female and states that it is 5.2 mm. long. Probably because of poor illumination or magnification, he failed to see the small scape in the middle of the epigynum. F.O.P.-Cambridge had the species from Panama and in the brief description mentions that it is 8.5 mm. long. He also had the type before him. It is a common species at Barro Colorado, Canal Zone, but all specimens seen are about 5.0–5.5 mm. long, so that the size mentioned by Cambridge is probably an error. Such a discrepancy in size is often misleading.

Aranea vesta spec. nov.
Figures 4, 6

Female. Length, 5.5 mm., ceph. 2.6 mm., abd. 3.5 mm. long, 3.5 mm. wide.

Cephalothorax dull yellow, paler on cephalic portion, anterior margin about half the greatest width, no thoracic groove, a pair of long colorless bristles at the end of the cephalic slope; *eyes* cover the anterior margin, both rows recurved, a.m.e. largest, separated by about a diameter with a pair of long colorless bristles between, each bristle from a distinct base, p.m.e. smaller than a.m.e., separated by more than a diameter with one long bristle between, lateral eyes subequal and touching; *quadrangle* wider in front and higher than wide; *clypeus* about a radius of a.m.e. with 6 or 8 long bristles on the margin; *mandibles* dull yellow, vertical, with scattered long colorless bristles, no boss, fang groove slightly oblique, upper margin with 4 teeth, lower margin with 3 smaller teeth; *labium* pale brown, wider than long, tip rebordered; *maxillæ* pale, twice as long as labium, sides parallel; *sternum* pale, triangular, three-quarters as wide as long, emarginate opposite the coxæ, pointed at the tip, fourth coxæ almost touching; *abdomen* as wide as long, but with no shoulder angles, a median pale area at the base which rapidly spreads to the width of the abdomen, on the distal half a median shield-shaped dark area, with emarginate sides, venter brown with two irregular pale spots anterior to the spinnerets; spinnerets dark, closely grouped very near the tip; *legs*, 1–2–4–3, femora dark

brown, other joints much paler with faint darker bands near the tips, long black spines, no ventral spines on the femora, III and IV tibiæ with dorsal basal spine; *epigynum,* area wider than long, a pale broad median scape with a recurved spoon-shaped tip, base with several short dark bristles, each side of the median scape rather narrow plain areas with outer margins heavily chitinized; a lateral view shows the median scape curved outward.

Male. Length, 3.6 mm., ceph. 2.0 mm. long, 1.5 mm. wide, abd. 2.0. mm. long, 1.6 mm. wide.

Cephalothorax pale brownish-yellow, cephalic portion narrowed and rather high, faint thoracic groove on the posterior third, scar of a median bristle midway between eyes and groove; *eyes* same as in the female with scars of the two bristles between the a.m.e.; bristles on the margin of the clypeus as in the female; *abdomen* oval, about two-thirds as wide as long, white with a dark folium on the posterior two-thirds with the emarginate sides as in the female, venter pale brown, with a pair of very faint pale spots anterior to the spinnerets; *legs,* 1–2–4–3, II right missing, pale with vague broad dark bands at the base and tip of tibiæ, I and II coxæ with a small hook, no ventral spines on the femora, spines long and dark, I pair, tibia, ventral, 2–2–2, basal and median pairs very long, lateral, 3–3, dorsal, 1–1–1, metatarsus, ventral, 0, prolateral, 1, retrolateral, 2, II pair, patella, at the tip, 1 very long, 1 short, tibia, ventral, 3p short at the base, 2 at the tip, metatarsus, dorsal, 1 at the base, III and IV tibiæ, dorsal basal spine, IV femur near tip a retrolateral row of 6 slender spines, III femur, a retrolateral row of 3 very slender spines; *palpus* pale, patella, paracymbium abruptly recurved and the tip broad and bifid; the parts of the palpus best understood from the figure.

Holotype ♀ Mexico; Acapulco, 19 December 1944 (S. Jones). Allotype ♂ Mexico; Acapulco, 18 December 1944 (S. Jones). Paratypes 6 ♀ 8 ♂ Mexico; Acapulco, 18 December 1944 (S. Jones).

The generic position of *Aranea vesta* is very uncertain. It cannot be placed in the genus *Neosconella* F.O.P.-Camb. as it lacks ventral spines on the femora

of both male and female. As the first coxa of the male has a hook, it cannot be placed in the genus *Metepeira* F.O.P.-Camb.

The epigynum agrees fairly well with the figure of *Aranea detrimentosa* (O.P.-Camb.) This species was described from both male and female but F.O.P.-Cambridge evidently decided that they were not of the same species and placed the male with *Epeira nigrohumeralis* O.P.-Camb. ♀ and never placed the female originally described under the name *detrimentosa*. The male of *A. detrimentosa* has one long bristle on the tibia and another from the patella of the palpus and the parts of the palpus are quite unlike those of *A. vesta*.

Genus *Eriophora* Simon 1864

Eriophora edax (O.P.-Camb.)

Figure 7

Epeira edax O.P.-Cambridge, 1863, p. 30. "♂ ♀ Rio de Janeiro, Brazil."

The specimen of *Eriophora edax* from Acapulco has a distinct tubercle above the spinnerets and the shoulder angles are slightly developed, both characters unlike the common *Eriophora balaustina* (McCook), found in Florida and Cuba. The abdomen is about 8.0 mm. long and the scape is 4.0 mm. The base is heavily chitinized and the tip extends beyond the base of the spinnerets. The species has been reported from various parts of Central America and from Puerto Rico.

Genus *Neosconella* F.O.P.-Cambridge 1903

Neosconella lineatipes (O.P.-Camb.)

Epeira lineatipes O.P.-Cambridge, 1889, p. 30, pl. 7, figs. 17, 18. "♀ ♂ Guatemala; road between Retalhulen and Mazatenango, Santa Ana, Guatemala City."

Epeira lineatipes Keyserling, 1892, p. 190, pl. 9, fig. 141.

Neosconella lineatipes F.O.P.-Cambridge, 1902, p. 476, pl. 45, figs. 5, 6.

This species is a little smaller than the one described

by O.P.–Cambridge but it has the same spots and lines on the anterior pairs of legs, the mandibles and the cephalothorax. The figure of the epigynum given by O.P.–Cambridge is very misleading as the scape is turned back and it is not in a normal position. Keyserling has a much better description and the figures of the scape is in the normal position.

♀ Mexico; Acapulco, 18 December 1944 (S. Jones).

Family Clubionidæ

Genus *Anyphænella* Bryant 1931

Anyphænella pavida spec. nov.

Figure 12

Female. Length, 3.0 mm., ceph. 1.0 mm., abd. 2.0 mm. *Cephalothorax* pale, slightly darker about the anterior margin, faint darker lateral stripes from the lateral eyes to the posterior margin, moderately convex, thoracic groove faint; *eyes,* anterior row straight, eyes subequal and equidistant, separated by about a radius, posterior row procurved, slightly longer than the anterior row, separated by more than a diameter; *quadrangle* higher than wide and wider behind than in front; *clypeus* about equals the diameter of a.m.e.; *mandibles* brown, vertical, rather long, fang groove transverse, impossible to see the teeth on the fang groove; *labium* gray, about as long as wide; *maxillæ* pale, not twice as long as labium, sides parallel, not emarginate on the outer margins; *sternum* pale, nearly as wide as long, convex, widest between II coxæ, IV coxæ separated by less than a diameter; *abdomen* pale, shaded with gray in no definite pattern, convex, venter pale, opening of the posterior spiracle one third nearer the spinnerets than to the fold, spinnerets closely grouped; *legs,* I right missing, 1–4–2–3, very slender and frail, pale, I pair very long, I tibia, 1.4 mm. long, spines, ventral, 2–2, long and slender, lateral, 2–2, metatarsus, ventral, 2–2; *epigynum,* area almost twice as wide as long, all the parts beneath the surface deeply colored, a pair of large dark sacs just anterior to the fold, separated by fully a diameter with a notched margin between, in the anterior half and slightly closer together, a pair of

oblique openings with chitinized margins and a darker point at the tip which may be the beginning of tubes.

Holotype ♀ Mexico; Acapulco, in palms, 18 December 1944 (S. Jones).

Anyphænella pavida is very delicate and fragile, so that it is impossible to count the teeth on the fang groove or the spines on the slender legs but the parts of the epigynum are very distinct. The spider has not oviposited.

Family Salticidæ

Genus *Habronattus* F.O.P.-Cambridge 1901

Habronattus cambridgei spec. nov.

Figures 13, 15, 16

Habronattus viridipes F.O.P.-Cambridge, 1901, p. 224, pl. 21, figs. 4, 5, nec Hentz, 1846; nec *Pellenes viridipes* Peckham, 1885, 1900.

Male. Length, 4.5 mm., ceph. 2.5 mm. long, 1.5 mm. wide, abd. 2.1 mm. long, 1.6 mm. wide.

Cephalothorax dark chestnut brown, with a narrow band of white hairs above the anterior row of eyes and a few scattered white hairs in the ocular area and about the lateral margins, a dark triangle with the apex at the groove that extends to the posterior margin, cephalothorax fairly high, widest posterior to the dorsal eyes or between the second pair of legs, thoracic groove short in a circular depression between the dorsal eyes and midway in the cephalic plane, thoracic slope quite abrupt; *eyes*, anterior row recurved so that the upper margins form a straight line, a.m.e. touching, a.l.e. about one-half the diameter of a.m.e. and separated from them by a little more than a line, small eyes about midway between the first and third rows, dorsal eyes subequal with a.l.e.; *quadrangle* slightly wider behind than in front and about twice as wide as long; *clypeus* wanting below a.m.e. and no fringe on the margin; *mandibles* dark brown, vertical, long and narrow, fang groove very short, upper margin with three contiguous teeth, lower margin with one sharp tooth; *sternum* dark brown, oval, first coxæ separated by a diameter, fourth coxæ touching; *abdomen* discolored so that markings are obscured, ven-

ter brown, with lateral darker stripes; *legs,* 3–4–1–2, III pair not modified and no fringes on any leg, brown, with pale rings most conspicuous on the posterior pairs, I pair, femur, prolateral surface slightly flattened and covered with white scales, patella and tibia with many white scales, spines, patella, prolateral, 1, tibia, ventral, 2–2–2, metatarsus, ventral, 2–2, basal pair very long, II pair with area of white scales on femur smaller than on I pair, III and IV tibiæ with dorsal basal spine; *palpus* not as long as cephalothorax, femur and patella covered dorsally with white scales, tibia and tarsus pale brown, tibia not as long as patella, tibial apophysis dark, tarsus almost circular, bulb about circular, flattened, embolus from a distinct lobe of the bulb, starting about the middle on the outer side and ending in a very slender tube in a groove at the tip of the cymbium, the second process heavier, from just below the middle of the bulb, with an abrupt turn at the lower margin and ending about opposite the origin on the inner margin.

Female. Length, 5.1 mm., ceph. 2.4 mm. long, 1.7 mm. wide, abd. 2.5 mm. long, 1.7 mm. wide.

Cephalothorax pale brown, scantily covered with white hairs, darker about the eyes, moderately high, widest posterior to the dorsal eyes, thoracic groove short, in a circular depression about the middle of the cephalic area, thoracic slope concave; *eyes* as in the male; *mandibles* and *mouth parts* as in the male; *sternum* a pale brown, oval, first coxæ separated by more than a diameter, fourth coxæ touching; *abdomen* oval, dorsum flattened, pale, speckled with small patches of black hairs, venter pale outlined by a paler square; *legs,* 3–4–1–2, anterior pairs pale brown, on dorsal side, much paler on ventral, posterior pairs distinctly ringed on the dorsal side with dark and pale rings, ventral side pale; *epigynum* of the typical form with an oblique oval opening each side of a small triangle, posteriorly each side curved dark tubes with a small opening below the triangle as figured.

Holotype ♂ Mexico; Acapulco, 17 December 1944 (S. Jones). Allotyye ♀ Mexico; Acapulco, 17 December 1944 (S. Jones).

F.O.P.-Cambridge probably had this species which he identified in the Biol. Centr. America, as *Habronattus viridipes*, following the Peckhams identification of 1885 and 1900, of the Hentz species. Later in 1909, the Peckhams corrected their identification of *viridipes* Hentz and named the species found in Texas, *fallax*. A year latter, in 1910, Petrunkevitch in his catalogue, erroneously considered the Mexican species the same as *fallax* from Texas.

Habronattus viridipes (Hentz) has a heavy fringe of white hairs on the first pair of legs and the third patella is modified. *Habronattus fallax* (Peckham) has no fringe on the first pair of legs, the third patella not enlarged and the legs conspicuously ringed with white and black hairs. *Habronattus cambridgei* has no fringe on the first pair of legs, but the femur is slightly flattened and the area is covered with white scales; the cephalothorax is more slender than in the other two species and has a brush of white hairs above the first row of eyes and no white scales on the clypeus.

The female of *Habronattus cambridgei* is strikingly unlike the other species. Both *viridipes* and *fallax* have distinct abdominal patterns as in the males, while in *cambridgei* the abdomen has no dorsal pattern. The epigynum is typical of others of the genus.

Genus *Metaphidippus* F.O.P.-Cambridge 1903

Metaphidippus gratus spec. nov.

Figures 8, 9, 11

Male. Length, 5.4 mm., ceph. 2.5 mm. long, 2.1 mm. wide, abd. 5.1 mm. long, 1.6 mm. wide.

Cephalothorax chestnut-brown, with scattered iridescent white hairs, wide lateral stripes of white hairs from the a.m.e. that do not meet at the posterior margin, cephalic portion high, with a recurved shallow depression posterior to the dorsal eyes, then sloping gradually to the posterior margin, lateral margins rounded not parallel, thoracic groove short in the depression between the dorsal eyes; *eyes*, anterior row recurved, so that the upper margins of a.m.e. and the lower margins of a.l.e.

form a straight line, a.m.e. separated by little more than a line, and from a.l.e. by about a diameter of a.l.e., a.l.e. about a radius of a.m.e., second row of eyes one-third nearer anterior row than to dorsal eyes, p.l.e. not on the extreme margin of the carapace and subequal with a.l.e.; *quadrangle* slightly wider behind than in front; *clypeus* about wanting below a.m.e.; *mandibles* paler than cephalothorax, slightly divergent, basal third covered with long white hairs, only slightly narrower at the base than at the fang, fang groove with a blunt cusp on the upper margin, lower margin with a small sharp tooth opposite the cusp on the upper margin, fang a little longer than the groove; *labium* dark brown, longer than wide, tip reborderered; *maxillæ* brown, not twice as long as labium, upper outer angle produced in a slight lobe; *sternum* brown, longer than wide; *abdomen* oval, dorsum flat, a dark brown with wide lateral stripes of white hairs that do not meet at the base but join above the spinnerets, venter a paler brown; *legs,* 1–4–2–3, dark brown, I pair slightly enlarged, I femur with a retrolateral fringe of short white hairs, scattered white scales on tibia, other legs brown, with a few white hairs, spines, I pair, femur prolateral, 1, patella, 0, tibia, ventral, 2–2–2, all shorter than the diameter of the joint, the prolateral row extends to the middle of the joint, metatarsus, ventral, 2–2, II pair, spines the same as on I pair but smaller, few spines in III and IV pairs, no dorsal basal spine on III and IV tibiæ; *palpus* about as long as cephalothorax, femur slender, patella and tibia subequal, cymbium small and slender almost three times as long as as wide, tibial apophysis a slender straight spur, not as long as the diameter of the joint and parallel to the cymbium, bulb only slightly prolonged onto the tibia, embolus at the tip, a straight stout spur, abruptly narrowed near the tip.

Female. Length, 6.4 mm., ceph. 2.6 mm. long, 2.1 mm. wide, abd. 4.0 mm. long, 2.5 mm. wide.

Cephalothorax chestnut-brown, with scattered white hairs, no wide white marginal stripe as in the male and the sides not rounded, recurved shallow depression posterior to the dorsal eyes with the thoracic groove as in

the male; *eyes* the same as in the male; *clypeus* as in the male, with a mass of white hairs beneath the a.l.e. and a fringe of white hairs on the margin; *mandibles* dark brown, basal half with a mass of white hairs, vertical, not narrowed at the base as in the male, fang groove almost horizontal, upper margin with a scopula of stiff hairs, lower margin with a sharp tooth; *labium* dark brown, longer than wide; no lobe on the maxillæ; *sternum* as in the male; *abdomen* pale, with a median dark stripe, heaviest on the posterior two-thirds, with the lateral margins broken by three pairs of spots covered with white hairs, the anterior pair at the first muscle spots, venter pale; *legs*, 1–4–2–3, III left missing, I pair slightly enlarged, dark with no rings, other pairs paler, III and IV pairs with faint dark rings at the ends of each joint, spines as in the male; *epigynum*, area wider than long, with a pair of oval, slightly oblique openings at the anterior portion, the median area convex and the posterior margin deeply edentate.

Holotype ♂ Mexico; Acapulco, 19 December 1944 (S. Jones). Allotype ♀ Mexico; Acapulco, 19 December 1944 (S. Jones).

Metaphidippus gratus is related to *Metaphidippus lanceolatus* F.O.P.-Cambridge, known only from the male, from Mexico and Guatemala, and also found by Dr. Chickering at Boquete, Pan. Rep., and identified by Mr. Banks from Costa Rica. Cambridge has figured three types of teeth on the fang groove, showing that the teeth are very variable in this species. The legs are described with dark and pale rings and the abdomen has white lateral stripes that meet at the base, the area between with paired dark spots. The Acapulco species is larger and darker than the specimens of *M. lanceolatus* from Costa Rica.

Metaphidippus purus spec. nov.

Figures 10, 14

Male. Length, 3.6 mm., ceph. 1.6 mm. long, 1.6 mm. wide, abd. 2.0 mm. long, 1.1 mm. wide, mand. 1.0 mm. long.

Cephalothorax a deep mahogany-brown, eyes on black

spots, a narrow stripe of white hairs below the second eye row to near the posterior margin, this is not a marginal stripe, and a faint recurved cross bar of white hairs posterior to the dorsal eyes, a pair of dark spots in the middle of the eye area, many small white iridescent hairs on entire carapace, cephalic portion high and continued on the same plane halfway to the posterior margin when it falls abruptly, widest posterior to the dorsal eyes, lateral margins rounded, thoracic groove short; *eyes,* anterior row recurved, seen from the front, the upper margins of the eyes form a straight line, eyes equidistant, a.m.e. separated by little more than a line, a.l.e. less than a radius of a.m.e., eyes of the second row nearer the first than to the third row, dorsal eyes not quite on the extreme margin of the carapace; *quadrangle* slightly wider behind than in front; *clypeus* very narrow below a.m.e., with a fringe of white hairs on the margin; *mandibles* brown, shining, no hairs, slightly divergent, rounded and slender, only slightly wider at the base than at the tip, upper margin of the fang groove with one small tooth one-third from the base of the fang, lower margin with a much larger tooth or cusp near the base of the fang, fang long and sinuous; *labium* dark brown, longer than wide with a recurved tip; *maxillæ* brown, twice as long as the labium, with upper outer angle produced in a short lobe; *sternum* brown, oval, convex; *abdomen* oval, a narrow lateral stripe of white hairs that do not meet at the spinnerets and is narrowly separated at the base, a pale middle stripe with darker stripes each side on the posterior half broken into four pairs of darker spots, scattered iridescent scales on the pale area, venter pale; *legs,* 1–4–2–3, II left missing, I pair enlarged, brown, with tarsus pale, femur flattened laterally, spines, patella, 0, tibia ventral, 2–2–2, prolateral row extends to about the middle of the joint, metatarsus, ventral, 2–2, II pair paler than the I pair, spines, patella, 0, tibia, ventral, 2–2–?, III and IV pairs with distal half of femur dark, no spines, I coxa brown, others pale and quite long; *palpus* longer than cephalothorax, femur curved, basal half pale with large white scales, patella longer than tibia, tibial apophysis a slender black spine

parallel to the cymbium, bulb small, not extending onto the tibia, embolus a slender curved black spine at the tip of the bulb; both bulb and embolus may be somewhat distorted.

Female. Length, 4.4 mm., ceph. 2.0 mm. long, 1.6 mm. wide, abd. 2.6 mm. long, 1.6 mm. wide.

Cephalothorax the same as in the male, except that the recurved transverse bar of white scales is much heavier and the lateral stripe of white scales is quite short, a clavate bristle below the eyes of the second row; *eyes* same as in the male; *clypeus* the same as the male with a fringe of white hairs on the margin; *mandibles* dark brown, with white hairs, vertical, fang groove transverse, lower margin with a fissident tooth; *labium* and *maxillæ* same as in the male, but no lobe on the upper outer angle; *sternum* dark brown, all coxæ pale; *abdomen* oval, dorsum flattened, with a pale median stripe that extends just beyond the middle, a dark basal spear-mark, either side the dark areas are broken into four dark spots as in the male, often with short cross bars of white scales separating the dark spots, venter pale with a large dark triangle in the center; *legs*, 1–4–2–3, shorter than in the male, I pair not enlarged, brown, tarsus and metatarsus pale, femur with a mass of white scales on the sides, spines, patella, 0, tibia, ventral, 2–2–2, metatarsus, ventral, 2–2, II pair, femur brown with long white hairs, tibia with a dark ring at the tip, other joints pale, spines, patella, 0, tibia, ventral, a prolateral row, 1–1–1, metatarsus, ventral, 2–2, III and IV pairs, pale with dark rings on femora and tibiæ, very few spines; *epigynum*, probably recently moulted as the parts are only lightly chitinized, on the anterior half a pair of large oblique oval openings, posterior margin deeply notched with a pair of small circular hyaline sacs each side.

Holotype ♂ Mexico; Acapulco, in lagoon on rubber trees, 18 December 1944 (S. Jones). Allotype ♀ Mexico; Acapulco, on rubber trees, 18 December 1944 (S. Jones). Paratypes, ♀♀ pullus, Mexico; Acapulco, on rubber trees, 18 December 1944 (S. Jones).

Metaphidippus purus is related to *Metaphidippus*

pernotus (Petr.) = *M. pernix, M. felix* F.O.P.-Camb., nec Peckham, from Guatemala but it lacks the large tooth on the upper margin of the fang groove and has but one small tooth instead of two teeth near the base of the same margin. The tibial apophysis is much longer on *M. purus* and the median area of the dorsum is broken into four pairs of dark spots. The female of *M. pernotus* (Petr.) is not known.

Genus *Tomis* F.O.P.-Cambridge 1901

Tomis jonesæ spec. nov.

Figure 17

Male. Length, 5.1 mm., ceph. 2.5 mm. long, 2.0 mm. wide, abd. 2.6 mm. long, 1.6 mm. wide.

Cephalothorax chestnut-brown, ocular area covered with short white scales with a stripe on the median third of longer dark hairs that extends onto the clypeus, a broad marginal stripe of white hairs from the anterior eye row to the posterior margin and a small median spot of white hairs on the posterior slope of the cephalothorax, carapace rather high, sloping very gradually from the anterior eye row to halfway between the groove and the posterior margin where it falls abruptly, widest posterior to the groove, groove very short and in a circular depression; *eyes,* anterior row recurved, eyes very unequal in size, a.m.e. separated by little more than a line, and from a.l.e. by about double that space but less than a radius of a.l.e., small eyes midway between first and third rows, p.l.e. smaller than a.l.e. and not on the margin of the carapace; *quadrangle* narrower behind than in front and two-thirds as long as wide; *clypeus* about a radius of a.m.e., slightly retreating with a long median recurved bristle below a.m.e.; *mandibles* dark brown, vertical, rather small, fang groove transverse, upper margin with four small teeth, lower margin with no teeth, fang with a thick base; *labium* brown, longer than wide, tip pale and narrower than the base; *maxillæ* brown, not twice as long as the labium; *sternum* brown, flat, about two-thirds as wide as long, with many long hairs about the margins, fourth coxæ separated by about

half a diameter; *abdomen* oval, brown, dorsum flat, clothed with brown and white hairs in no distinct pattern except for three dark chevrons on the distal half and large spots of white hairs each side, venter pale with many white hairs; *legs,* 4–1–2–3, pale, with rather vague darker rings on the tibiæ and patellæ, spines, I and II pairs, tibiæ, ventral, 2–2–2, metatarsi, ventral, 2–2, III and IV tibiæ, dorsal basal spine and median and apical whorls of spines; *palpus,* about as long as cephalothorax, brown, femur with a dorsal crest of white hairs, patella and tibia of about equal length, tibia about as wide as long with a retrolateral fringe of long white hairs and a prolateral brush of dark hairs so that the joint appears very broad, tibial apophysis a very slender dark shiny spur that extends beyond the middle of the cymbium, cymbium little longer than the tibia, embolus starts at the lower margin of the bulb, follows the contour of the cavity and ends as a slender free tip at the tip of the cymbium; in the bulb a conspicuous tube forms a U-shaped loop.

Holotype ♂ Mexico; Acapulco, on grass at beach, 18 December 1944 (S. Jones).

The genus *Tomis* was based by F.O.P.-Cambridge on a single species, *Tomis palpalis* F.O.P.-Camb. from Teapa, Mexico. *Tomis jonesæ* is separated from the genotype, by the slightly smaller size, the mass of short white hairs on the ocular area with the median stripe of longer dark hairs, the four teeth on the upper margin of the fang groove that are not grouped on a lobe or process as figured by Cambridge, and the U-shaped tube in the bulb of the palpus. Both species have the slender shining tibial apophysis and a very broad tibia of the palpus.

The stripe of black hairs on the ocular area is very conspicuous and if present on the genotype, would have been noted by F.O.P.-Cambridge.

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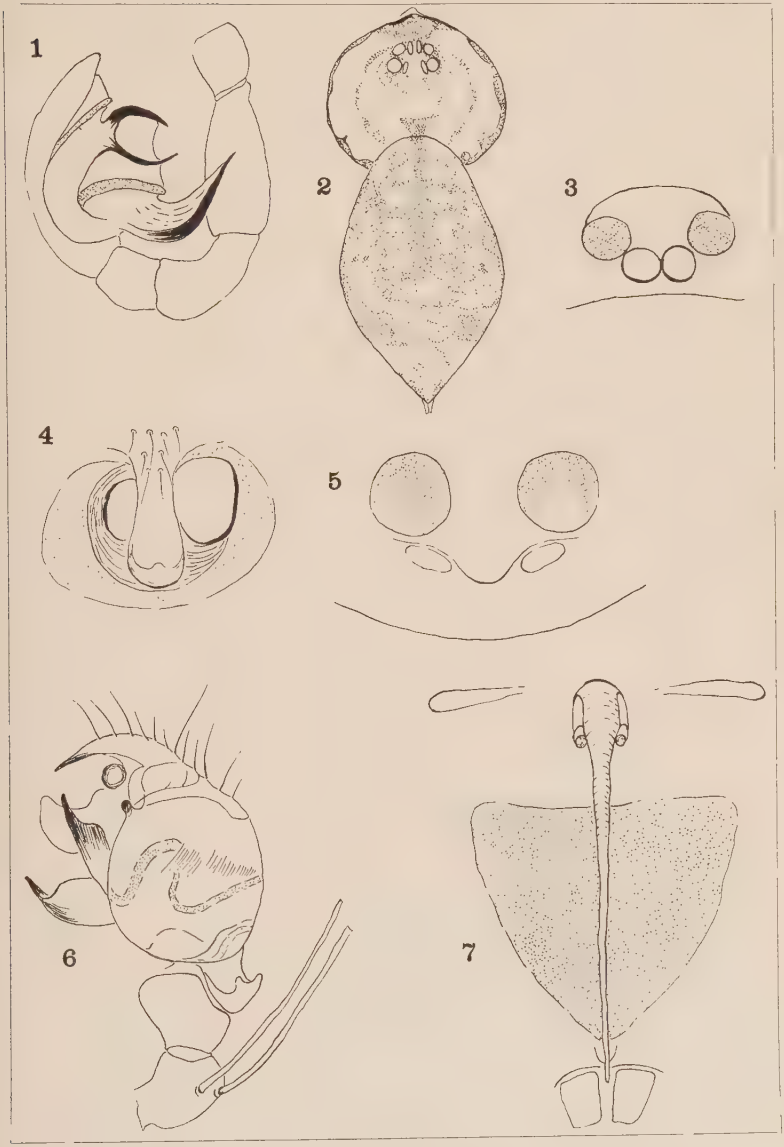
Explanation of Plate 9

Fig. 1. *Œcobius beatus* Gertsch and Davis, left palpus.
Fig. 2. *Œcobius beatus* Gertsch and Davis, male, dorsal.
Fig. 3. *Theridion maculipes* spec. nov., epigynum.
Fig. 4. *Aranea vesta* spec. nov., epigynum.
Fig. 5. *Theridion placidum* spec. nov., epigynum.
Fig. 6. *Aranea vesta* spec. nov., left palpus.
Fig. 7. *Eriophora edax* (Blackw.), epigynum.

PSYCHE, 1948 VOL. 55, PLATE 9

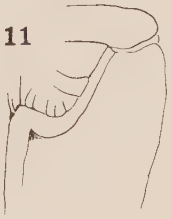


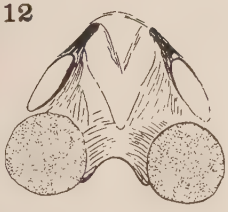
BRYANT—SPIDERS FROM MEXICO

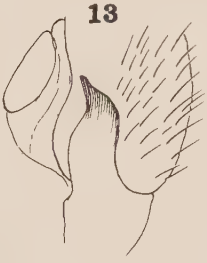
Explanation of Plate 10

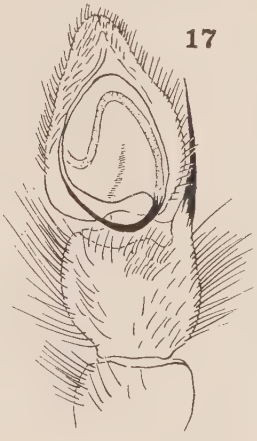
Fig. 8. *Metaphidippus gratus* spec. nov., left palpus.
Fig. 9. *Metaphidippus gratus* spec. nov., epigynum.
Fig. 10. *Metaphidippus purus* spec. nov., left palpus.
Fig. 11. *Metaphidippus gratus* spec. nov., male, left mandible, ventral.
Fig. 12. *Anyphœnella pavida* spec. nov., epigynum.
Fig. 13. *Habronattus cambridgei* spec nov., left palpus, tibial apophysis.
Fig. 14. *Metaphidippus purus* spec. nov., epigynum.
Fig. 15. *Habronattus cambridgei* spec. nov., left palpus, ventral.
Fig. 16. *Habronattus cambridgei* spec. nov., epigynum.
Fig. 17. *Tomis jonesœ* spec. nov., left palpus.

PSYCHE, 1948 VOL. 55, PLATE 10









BRYANT—SPIDERS FROM MEXICO

A REDESCRIPTION OF THE TYPES OF *STRUMIGENYS MANDIBULARIS* F. SMITH, AND *CEPHALOXYS CAPITATA* F. SMITH

By Horace Donisthorpe, F.Z.S., F.R.E.S.
British Museum (Natural History), London

As my old friend the late Professor W. M. Wheeler once said to me, the Genus *Strumigenys* F. Smith much requires to be revised. This revision, I understand, is now being undertaken by Mr. W. L. Brown, Jr., at the Biological Laboratories, Harvard University. As F. Smith's descriptions of *Strumigenys mandibularis* and *Cephaloxys capitata* are quite inadequate for modern requirements; and as the rules of the British Museum do not allow types to be sent out of the Museum, I decided to redescribe the types of these two species. This I have done in the following short paper, which I trust will be of use to Mr. Brown in his revision of the genus *Strumigenys* F. Smith.

Strumigenys (*Strumigenys*) *mandibularis* F. Smith. ♀. Reddish brown, top of head blackish, the clypeus and base of lobes being reddish brown, first segment of gaster somewhat marked with black, eyes black, legs brownish yellow. *Head* triangular or cordate, narrowed in front, posterior border deeply excised, the excision being rounded, the posterior angles, consisting of two broad bluntly pointed lobes, separated by the excision, which are depressed above anteriorly, feebly longitudinally striate and very finely granulate, clothed with a number of very short and narrow adpressed glittering scale-like hairs; *mandibles* not very long (0.6 mm.), stout, inner border above armed with two blunt teeth towards the apex, apex armed with three teeth, the two outside ones long and pointed, crossing each other when closed, the one between them short and blunt; a row of blunt not very close spine-like outstanding hairs is arranged along the inner border and also between the apical teeth; *clypeus* large, rather flat, transverse anterior border rounded and furnished with a row of clubbed hairs, posterior bor-

der widely V-shaped, the furrow which separates it from the rest of the head rather deep; *frontal carinæ* forming the upper border of a rather deeply hollowed scrobe above the eyes; *eyes* large, round oval, *ocelli* small; *antennæ* six-jointed, fairly long; *scape* stout, curved, longer than the funiculus, very finely granulate, with a few adpressed short hairs on upper surface, anterior border with a row of longer and shorter not very close outstanding blunt spine-like hairs; *funiculus* covered with close adpressed silvery hairs pointing forwards, last two joints long and broader than those preceding, last joint pointed and longer than the two preceding taken together. *Thorax* stout, convex, very finely granulate; *pronotum* furnished with a neck anteriorly, transverse, posterior border semicircular, embracing the mesonotum; *mesonotum* large, prominent, about as long as broad, broadest just before base, posterior border almost straight, a very fine narrow suture separates it from præscutellum; *præscutellum* narrow, transverse, almost flat, separated from scutellum by a broad rounded suture which is deeper than that separating it from mesonotum; *scutellum* round oval, lozenge-shaped, transverse, somewhat prominent; *metanotum* very narrow, transverse, situated beneath scutellum; *epinotum* descending abruptly from beneath metanotum, armed with two short sharp teeth, space between the teeth somewhat hollowed out. *Petiole* with a long peduncle, and a node at apex rounded above and at sides, finely granulate; *post-petiole* finely granulate, broader than node of petiole, broadest at apex, rounded above and at sides. A white spongiform substance is present beneath the petiole and post-petiole and also along the junction between the petiole and post-petiole, and the post-petiole and gaster; *gaster* broadly oval, pointed at apex, broader in front than behind, broadest just before apex of first segment which is considerably longer than the rest of the gaster and very finely longitudinally striate. Rest of segments smooth and shining. Legs rather long, clothed with long decumbent glittering scale-like hairs. Long. 5 mm.

Redescription of F. Smith's type of *Strumigenys man-*

dibularis, a deälated female taken by Henery Walter Bates at St. Pawlo, Brazil.

F. Smith's original description may be found in the Journal of Entomology, 1862, vol. 1, pp. 72–73, pl. 4, figs. 6 and 7.

Strumigenys (*Cephaloxys*) *capitata* F. Smith

♀. Light brownish red; eyes, space between ocelli, and teeth of mandibles black. Head, thorax, and node of petiole finely granulate, declivity of epinotum, petiole, and gaster smooth and shining.

Head long triangular, or cordate, considerably narrower at apex than at base, broadest across ocelli, posterior angles rounded, posterior border moderately deeply excised; *mandibles* (only the left is present) rather short, pointed at apex, curved, the masticatory border armed with a row of small sharp teeth; *clypeus* almost as broad as long, somewhat flat, anterior and posterior borders rounded, furrows separating it from rest of head narrow but well marked; *frontal carinæ* forming the upper border of two rather deep scrobes above and ending beyond eyes; *eyes* fairly large, round oval, not very convex; *ocelli* small; *antennæ* six-jointed, scape curved, upper surface flat, not as long as funiculus; *funiculus* with last two joints long, but last joint pointed, and about as long as the preceding joints all taken together. *Thorax* longer than broad, but stout and convex; *pronotum* with a neck, anterior border rounded, anterior angles blunt, posterior border deeply excised embracing the mesonotum; *mesonotum* about as long as broad, narrower in front than behind, narrowed to apex, anterior border rounded, posterior border almost straight, a thin slightly raised line is present down centre of mesonotum; *præscutellum* very narrow, marked with short, not very close longitudinal ridges; *scutellum* fairly convex, transverse oval, anterior border almost straight, posterior border rounded, jutting out over metanotum and epinotum; *metanotum* very narrow and transverse, almost hidden beneath scutellum; *epinotum* armed with two short pointed teeth, dorsal surface transverse,

somewhat flat, angle between dorsal surface and declivity abrupt, declivity longer than dorsal surface, somewhat concave. *Petiole* pedunculate, upper side of node transverse, flat, anterior border and angles rounded, sides and posterior border almost straight; *post-petiole* convex, broader than node of petiole, broadest before apex, sides rounded, upper surface somewhat convex, and very finely longitudinally striate at base; *gaster* long oval, pointed at apex, a row of short longitudinal striae are present at base of first segment which is considerably longer than the rest of the gaster. A white spongiform substance is present beneath the petiole and post-petiole, and at the junction of the same, and with the gaster. The whole body appears to have been clothed with short narrow scale-like hairs and scattered outstanding spine-like hairs, but many of the former, and most of the latter have apparently been rubbed off. *Legs* moderate. Long. 3 mm. Described from a single deälated female, the type of F. Smith's *Cephaloxys capitata* from New Guinea.

F. Smith's original description may be found in the Journ. Linn. Soc. Lond. Zool., 1864, vol. 8, p. 77, pl. 4, fig. 5. In the larger figure of the head, the antennæ are drawn with only five joints!

My best thanks are due to Professor G. D. Hale Carpenter for kindly lending me the type to redescribe.

A NEW SPECIES OF *CORYDALUS* (NEUROPTERA)[1]

By Nathan Banks

Holliston, Mass.

Corydalus ecuadorianus sp. nov.

Head and pronotum nearly black; meso-and metanotum rather paler, pleura nearly black; legs brown to yellowish brown, bases of tibiæ paler; abdomen black above, only a little paler beneath; antennæ black beyond the first few rufous joints; vertex with the smooth areas showing reddish as in *cornuta,* but reddish instead of yellowish; the smooth areas on pronotum, however, are scarcely paler than rest of surface.

Fore wing heavily marked with dark brown to black, much broken up by pale and whitish areas, rarely round, mostly irregular; cross-veins black; costal area brown on basal half, but each cell has some pale in it, beyond the costal area is largely pale with black cross-veins, some bordered; behind there are some pale spots in nearly every cell, the largest between the medius and its branch, and two pale bands in the cell behind it, two in radial area toward tip are also fairly large, and an elongate one in radial area beyond the first radial cross-vein; also one behind the origin of radial sector and reaching across the medius.

The hind wing is dark gray to brownish, but the apical half mostly brown, with black cross-veins, a square pale spot between second and third radial cross-veins, and a pale stretch in the subcostal area beyond, paler than in fore wing. Fore wing with about forty costals, in basal part several are curved, connected, or forked; the cross-vein from lower medius to cubitus is continuous with that from cubitus to cubital fork. In hind wing the first radial cross-vein (very oblique as in fore wing) ends at origin of second branch of radial sector, thus forming an X, and the second radial cross-vein does the same with the

[1] Published with a grant from the Museum of Comparative Zoölogy at Harvard College.

fifth branch of radial sector (this doubtless varies, but not seen in any other species).

Mandibles of female short, stout, the teeth short and blunt, the tip, however, rather long and slender; the lateral carina back of antenna and eye is very indistinct; the margin of clypeus is scarcely produced in the middle, the lateral teeth being more prominent; the marginal tooth behind the eye is small and sharp; the posterior ocelli are nearly round and two diameters apart, anterior ocellus rather small; the pronotum is a little shorter than in many species, and not much broadened behind.

Length of fore wing 65 mm., width 19.5 mm.

One female from Banos, Ecuador, August (MacIntyre), Type M.C.Z. No. 26020.

A handsome species, and the first one from South America with the head-scars showing.

CONCERNING *ESURIS* BARBER (NOT STÅL) AND *NEOSURIS* BARBER, WITH A NEW SUBSPECIES FROM IDAHO. (HEMIPTERA-HETEROPTERA: LYGÆIDÆ)

By H. G. Barber

Roselle, N. J.

For an understanding of the sequence of the descriptions it is necessary to cite the complete bibliography for my genus *Esuris* (not Stål), with some added comments:

1911 *Esuris castanea* Barber, Jl. N. Y. Ent. Soc. XIX, 27 (brachypterous form, Arizona).

1916 Bergroth, Proc. Roy. Soc. Vict. (N. S.), Pt. I, 15 (foot-note), remarks that *Esuris castanea* Barber does not belong to Stål's genus *Esuris*. This reprint was not received until after the publication of the following 1918 articles.

1918 *Esuris fulgidus* Barber, Jl. N. Y. Ent. Soc. XXVI, 51 (brachypterous form, Arizona). Notes the discovery of the macropterous form of *castanea* and transfers it to the tribe Myodochini.

1918 *Esuris* Barber (not Stål), Psyche, XXV, 78. Keyed to the tribe Myodochini.

1924 *Neosuris* new genus, Barber, Jl. N. Y. Ent. Soc. XXXII, 133. Erected for *castanea*, but leaving *fulgidus* in Stål's *Esuris*.

1946 Bueno, Entom. Amer. XXVI (N. S.), 68. Correctly placed both *castanea* and *fulgidus* in the genus *Neosuris*.

Genus *Neosuris* Barber 1924

Head much wider than long, imbedded nearly to the eyes; eyes mediocre, not strongly protruding; preocular portion of head subequal to the length of an eye; antenniferous tubercles very short; ocelli obsolete. Antennæ lightly incrassate, basal segment short, barely surpassing apex of tylus, second but little longer than third. Rostrum extended to the intermediate coxæ; basal segment

not quite reaching base of head. Pronotum somewhat longer than wide; lateral margins neither carinate nor impressed beneath; constriction between the two lobes shallow; anterior lobe but little wider than head across the eyes; posterior lobe not depressed, much shorter and subequally as wide as anterior lobe; anterior margin straight; posterior margin very slightly concavely arcuate. Scutellum flat, but little wider than long. Corium and clavus connate, in the same plane, the latter with three rows of punctures; corium very finely pilose, posterior margin straight, devoid of a membrane. The two trichobothria of the third visible ventral segment widely separated. Anterior femora strongly incrassate, with very few small spines beneath. Anterior tibia curved, finely serrate within. Pterygo-dimorphic.

Type: *Neosuris castanea* Barber.

The genus *Neosuris* was never adequately described. The character of the genus was indicated in the description of the brachypterous form of what at the time I mistakenly placed in Stål's genus. Not until 1918 was the macropterous form from the same locality recognized.

Macropterous form: Color fusco-castaneous, anterior and posterior margins of the pronotum and the clavus paler. Character of the head and antennæ as in the brachypterous form. Ocelli present, situated close to the eyes. Pronotum over one third wider than long, the constriction between the two lobes shallow; anterior lobe just over twice as long and about one fourth narrower than the posterior lobe; anterior margin straight; posterior margin very gently concavely arcuate; lateral margins neither carinate nor narrowly impressed beneath; anterior lobe finely closely punctate; posterior lobe more sparsely and coarsely punctate; narrow posterior margin impunctate. Scutellum one fifth wider than long, rather closely punctate, faintly carinate towards apex. Commissure one fourth shorter than the scutellum. Clavus with three regular rows of punctures. Corium sparsely, finely pilose, rather closely and coarsely punctate. Membrane hyaline, extended to apex of the abdomen. Venter finely pilose. Length 2.70 mm.

Neosuris apparently is most closely related to *Valonetus* Barber. In which case both of these genera should be assigned to Stål's tribe Rhyparochromini rather than to Myodochini where I placed them in my 1918 synoptic key.

Neosuris castanea fraterna, new subspecies

In both the brachypterous and macropterous forms the head and pronotum are more sparsely punctate than in the typical form and the clavus and corium somewhat more coarsely punctate. Although the colors tend to vary in this subspecies several specimens in the series are considerably darker than normal. Described from 25 specimens.

Type male (brachypterous); Kendrick, Idaho, August 13, 1938 (Professor H. M. Harris collection). Paratypes: 15 males and 9 females, all with the same data as the type. Two of the females are macropterous. One pair retained by the author.

Neosuris fulgida (Barber)

Esuris fulgidus Barber, Jl. N. Y. Ent. Soc., XXVI, 1918, 15.

Quite distinct from *castanea* by reason of the striking difference in color and punctation. Besides the difference in color and its polished aspect, the head pronotum and the scutellum are smooth and very nearly impunctate. Clavus and corium connate with no indication of a claval suture. Five rows of punctures parallel the lateral margin of the scutellum.

Only two specimens, both of the brachypterous form, have been seen. It is quite possible that with the discovery of the macropterous form it will be found that a new genus may have to be established to contain it.

FOUR NEW PERUVIAN CHIGGERS (ACARINA-TROMBICULIDÆ)[1]

By G. W. Wharton
Department of Zoölogy, Duke University

The specimens on which this paper is based were collected by O. P. Pearson and were obtained through Charles Remington from Harvard's Museum of Comparative Zoölogy. Their courtesy in transmitting the specimens is greatly appreciated. The records of the hosts from which these chiggers were removed were provided by O. P. Pearson.

Six species of chiggers have previously been reported from Peru: *Crotiscus thomasi* (Oudemans, 1910);[2] *Megatrombicula peruviana* (Ewing, 1929); *Odontacarus australis* Ewing, 1929; *Trombicula shannoni* Ewing, 1929; *Trombicula japa* Ribeyro and Bambaren, 1922; and *Eutrombicula alfreddugèsi tropica* (Ewing, 1928). The present paper increases the list to ten. Of the six species previously reported *Megatrombicula peruviana* is known only as an adult while *Trombicula japa* cannot be identified on the basis of available information and will probably have to become a species *incertæ sedis*.

While preparing this paper particular attention has been given to the modified setæ of the legs. Wharton 1947 and 1947a has shown that the chætotaxy of the legs is an important aid to the taxonomic study of larval trombiculids. As more and more species are studied, it becomes increasingly obvious that it is desireable to name these setæ. Grandjean 1935 worked out a system of nomenclature for the modified setæ on the last three segments of the legs of oribatid mites. However, his system applied to all instars and so cannot be readily modified to fit the present case. Nesbitt 1945 has named the setæ

[1] This paper is the result of work done in connection with research supported by a grant-in-aid from the Research Grants Division of the U. S. Public Health Service and is published with a grant from the Museum of Comparative Zoölogy at Harvard College.

[2] New combination based on unpublished work by H. S. Fuller.

on the tarsi of acarid mites and has thus been able to simplify their description.

In the trombiculid mites four types of modified setæ are found on the legs and palps as follows:

1. Blunt striated sensory setæ—one on the dorsal side of each tarsus of the first two pairs of legs and one at the base of the palpal tarsus on the ventral surface.
2. Pointed striated sensory setæ—on the genua and tibiæ of all leg, the tarsus of leg I, and the pretarsi of legs I and II. There may be on one tarsus III and the palpal tarsus, but this is unusual.
3. Microsensory setæ—may be present on the genua, tibiæ, and tarsi of legs I and II.
4. Whip-like setæ—one or more may be present on telofemur, genu, tibia, and tarsus of leg III.

Unfortunately these setæ are not all constant in their positions on the legs but may vary from species to species. It is therefore impossible to name them on the basis of location. One solution to the problem is to name the fixed setæ while reserving fluid terms for the others. The following system is suggested.

spur = blunt striated sensory seta on the tarsus. (The use of the term spur for this seta is adopted from Brennan 1947, Ewing in many papers has referred to this seta as the dorsal spine, but since it is usually rounded at its tip, Brennan's term is to be preferred.)

pretarsala = the striated sensory seta on the pretarsus.

subterminala = the pointed striated sensory seta on the dorsal prominence of tarsus I. (The term subterminal is taken from Ewing 1931.)

parasubterminala = a microsensory seta associated with the subterminal seta.

microspur = a microsensory seta close to the spur or situated between the spur and the subterminal seta.

tibiala = a pointed striated sensory seta on the tibia.

microtibiala = a microsensory seta on the tibia.

genuala = a pointed striated sensory seta on the genu.
microgenuala = a microsensory seta on the genu.
mastitarsala = a whip-like seta on the tarsus.
mastitibiala = a whip-like seta on the tibia.
mastigenuala = a whip-like seta on the genu.
mastifemorala = a whip-like seta on the femur.

By combing the names of the setæ as given above with the appropriate Roman numeral to indicate the leg on

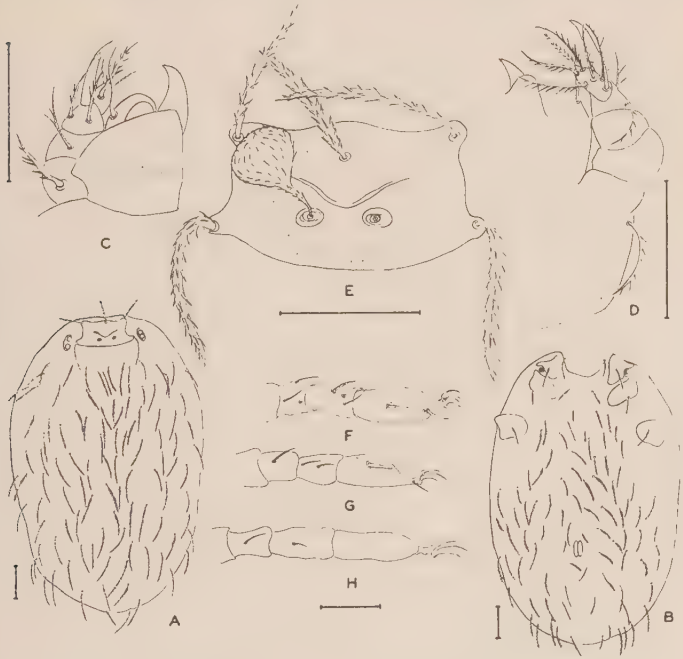


Fig. 1. *Euschöngastia phylloti* n. sp. A, dorsum; B, venter; C, dorsal view of gnathosoma; D, ventral view of gnathosoma; E, scutum; F, leg I with specialized setæ of genu, tibia, tarsus, and pretarsus; G, similar view of leg II; G, similar view of leg III. (Magnification of each figure, indicated by the line associated with the figure, represents 50 microns.)

which the seta or setæ are found the statement, "three whip-like setæ on tarsus III" can be reduced to "three mastitarsalæ III", or the statement," a blunt striated sensory seta on tarsus I" can be reduced to "spur I." A second and perhaps more important reason for naming

the modified setæ on the legs is that it will call attention to their presence and importance in the descriptions of trombiculid larvæ. A nameless structure is more likely to be ignored than one for which a name is available.

The above system of nomenclature will be adopted in describing the four species included in this paper. Special drawings of the legs (Figure I) have been made so that the modified setæ can be shown in detail.

Euschöngastia phylloti n. sp.

Body: Oval in shape, 560 microns long and 360 wide, striæ over entire surface. A pair of subequal eyes with well developed corneas on each side of the body at the level of the posterior lateral scutal setæ. Eyes about 15 microns in diameter. Anal opening ventral.

Gnathosoma: Cheliceræ stout, basal segments with angular lateral expansions, distal segment with a hyaline tip that bears a dorsal tooth, a minute ventral tooth, and a pointed apex. Palpal segment 1 with a feathered seta; 2 with a feathered seta; 3 with a seta that is nude or branched; 4 with a dorsal and ventral setæ feathered and lateral seta nude or branched, palpal claw with two small dorso-lateral tines and one large median tine; 5 with a spur, 5 ventral feathered setæ, and one dorsal feathered seta. Galeal seta nude. No stigmata or tracheæ present.

Legs: Coxæ I and II contiguous, coxa III about its own length posterior to coxa II. All coxæ with a single seta except the right coxa of specimen #540–2 which has two setæ. Sensory setæ on legs as follows:

I—2 genualæ, 1 microgenuala, 2 tibialæ, 1 microtibiala, 1 spur, 1 microspur lateral to the spur, 1 subterminala, 1 parasubterminala, and 1 pretarsala.

II—1 genuala, 2 tibialæ, 1 spur, 1 microspur posterior to the spur, and 1 pretarsala.

III—1 genuala and 1 tibiala.

Each leg terminates in a pair of tarsal claws that are lateral to a medium longer and thinner claw-like empodium.

Scutum: Roughly rectangular with punctate ornamentation. A definite V-shaped ridge anterior to the pseudostigmata. Posterior lateral setæ on lateral projections of the scutum. Scutal setæ stout and feathered. Sensillæ globose with fine setules over entire surface except on basal portion of stem. The Standard Data (Wharton 1946) follow:

Specimen	AW	PW	SB	ASB	PSB	AP	AM	AL	PL	S
540–1	79	105	20	30	21	43	55	69	75	32
621–6	69	99	19	31	23	35	55	62	62	23
621–8 Type	76	90	21	28	18	32	50	62	54	37
621–9	66	88	20	27	14	27	46	62	62	27
621–10	69	88	18	29	20	29	44	60	62	.....
Mean	72	94	19	29	19	33	50	63	63	30

Setæ: Dorsal setæ feathered about 55 microns long and arranged in indistinct rows, about 100 setæ in all. Humeral setæ not distinctly set off from other dorsal setæ. Sternal setæ feathered, 2 pairs between coxæ I and II, about 40 microns long. Approximately 60 ventral setæ arranged in indistinct rows from between coxæ III to the posterior end, feathered, and about 50 microns long.

Material: The following specimens all collected by O. P. Pearson at Caccachara, 50 miles S. W. of Ilave, Peru were studied:

O. P. Pearson's #	*Host*	*Date*	*Number of Specimens*
540	*Phyllotis darwini*	5 October 1946	2
547	*Chinchillula sahamæ*	7 October 1946	1
621	*Phyllotis darwini*	22 October 1946	13 + Type (MCZ No. 3026)

Diagnosis: Euschöngastia phylloti can be readily recognized in that it differs from other members of the genus as here interpreted in having the ventral setæ extend anteriorly between coxæ III.

Remarks: Ewing restricted the genus Euschöngastia to species with more than three prongs on the palpal claw, and erected the genus Ascoschöngastia to include similar specimens with two or three prongs on the palpal claw. The type species of Ascoschöngastia however has only

three setæ on the scutum instead of five. It seems more desireable at present to expand the meaning of Euschöngastia to include *E. phylloti* than to erect a new genus or to accept Ewing's interpretation of Ascoschöngastia.

Trombicula pearsoni n. sp.
Figure 2

Body: Oval, 350 microns long by 250 microns wide, striæ fine anteriorly coarser posteriorly, eyes opposite posterior lateral scutal setæ, anterior eyes larger 18 microns, posterior eyes 15 microns, both eyes on an indistinct ocular plate, anus ventral more than its own length from the posterior end in a partially engorged specimen.

Gnathosoma: Chelicerae with rounded basal segments that are longer than the narrow dorsally curved distal segments. Each distal segment with a tricuspid cap, one tooth dorsal, one ventral, and one apical. Palpal segments evenly rounded laterally; segment 1 with a feathered seta; 2 with a feathered seta; 3 with a feathered seta with fewer barbs than seta on 2; 4 with a nude dorsal seta, a branched lateral seta, and a feathered ventral seta. Palpal claw with two small outer prongs and a large median prong. Palpal segment 5 with a basal spur and seven feathered setæ. Galeal seta nude or with one or two barbs. No stigmata or tracheæ present.

Legs: Coxæ in partially engored specimens nearly contiguous. Each coxa with a single feathered seta. Sensory setæ on legs as follows:

I—a microgenuala between a pair of genulæ, a microtibiala lateral to the posterior of two tibialæ, a microspur anterior to the spur, a subterminala and parasubterminala that arise from a single base, and a pretarsala.

II —one genuala, 2 tibialæ, a microspur posterior to the spur, and pretarsala.

III—one genuala and one tibiala.

Each leg is terminated by a pair of curved claws that arise on the lateral tip of the pretarsus. A thin claw-like empodium is present between the claws.

Scutum: The scutum is roughly pentagonal, and is

completely covered by small, numerous, punctæ. The pseudostigmata are small and each has a short slit in front of it about equal to its diameter. Sensillæ are long filiform and have a few barbs on the distal two-fifths.

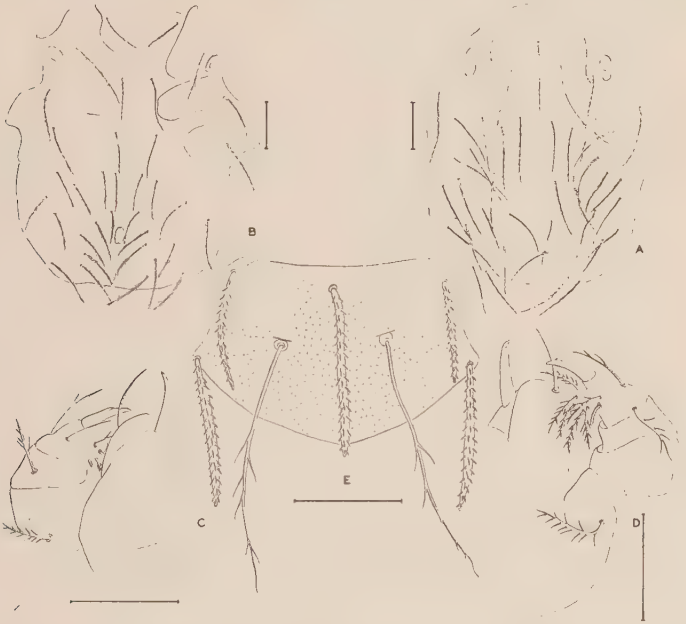


Fig. 2. *Trombicula pearsoni* n. sp. A, dorsum; B, venter; C, dorsal view of gnathosoma; D, ventral view of gnathosoma; E, scutum. (Magnification of each figure, indicated by the line associated with the figure, represents 50 microns.)

The scutal setæ are covered with short barbs. The Standard Data follow:

Specimen	AW	PW	SB	ASB	PSB	AP	AM	AL	PL	S
Type	86	118	47	52	40	54	72	51	66	97
456–1	94	117	46	41	46	48	63	48	69	.....
456–2	90	114	50	39	43	41	72	60	69	93
Mean	90	116	48	44	43	48	69	53	68	95

Setæ: The dorsal setæ are similar to the scutal setæ. They are about 85 microns long and are distributed in transverse rows from anterior to posterior as indicated

below. The anterior ventral setæ, including the sternal setæ, differ from the dorsal setæ in that their barbs are slightly longer and arise from only two lines along the shaft rather than all over the shaft. The arrangement in indefinite rows is given below.

Specimen	Dorsal setæ	Ventral setæ	Total
Type	2–8–5–8–4–6–4 + 9	2–2 + 16	66
456–2	2–6–2–8–7–7–4 + 14	2–2 + 16	70
456–1	2–8–6–8–6–8 + 18	2–2 + 18	78

Material: These specimens were collected by O. P. Pearson at Caccachara, 50 miles S.W. of Ilave, Peru, at an elevation of 16,000 feet.

O. P. Pearson's #	*Host*	*Date*	*Number of Specimens*
456	*Punomys lemminus*	13 September 1946	2 + Type (MCZ No. 3027)

Diagnosis: Trombicula pearsoni can be distinguished from other members of the genus because while it has a pentagonal scutum it lacks whip-like setæ on the third legs. In these characteristics it is similar to *Trombicula biops* n. sp. but can be distinguished from it most readily on the basis of the feathered dorsal seta on the palpal tibia in *T. biops*, as opposed to the nude seta found in this position in *T. pearsoni.*

Remarks: This species is named for the collector O. P. Pearson.

Trombicula biops n. sp.
Figure 3

Body: Elongated 462 microns by 200 microns, striæ well developed, eyes two on either side at the level of the posterior lateral setæ. No ocular plate present. Diameter of anterior eye 10 microns, posterior eye 8 microns. Anus about twice its length from the posterior end on the ventral side.

Gnathosoma: Basal segments of cheliceræ weakly angular laterally, distal segments short with tricuspid cap. Palpal segment 1 with a feathered seta; 2 with a feathered seta; 3 with a feathered seta; 4 with two branched setæ and a ventral feathered seta, palpal claw with two small subequal dorso-lateral prongs and a stout longer median

prong; segment 5 with one spur, 2 basal and 3 apical feathered setæ, and a large feathered dorsal seta. Galeal seta nude. No stigmata or tracheæ present.

Legs: Coxæ I and II contiguous, III separated by its own width from II. All coxæ with a single feathered seta. Leg I with a pair of genualæ with a microgenuala between

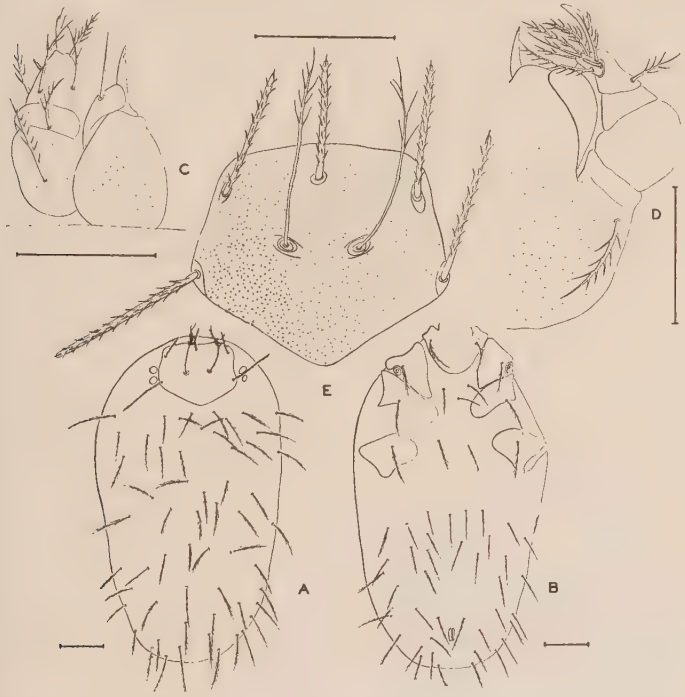


Fig. 3. *Trombicula biops* n. sp. A, dorsum; B, venter; C, dorsal view of gnathosoma; D, ventral view of gnathosoma; E, scutum. (Magnification of each figure, indicated by the line assoicated with the figure, represents 50 microns.)

them; two tibialæ in tandem with a microtibiala between them; a spur with a microspur half the length of the spur anterior to the base of the spur; subterminala with small parasubterminala arising from an independent setal base; one pretarsala. Leg II with one genuala, two tibialæ, a spur and microspur, and pretarsala. Leg III with a

genuala, a tibiala, but no whip-like setæ. Each leg is terminated by a pair of lateral ambulacral claws that flank a median longer and thinner claw-like empodium.

Scutum: The scutum is definitely pentagonal in shape. It is ornamented by closely set, irregularly placed punctæ. The pseudostigmata are small and bordered by short anterior and posterior ridges. The sensillæ are peculiar in that they have extremely short fine barbs along their entire length. The scutal setæ are provided with short barbs over their entire surface. The Standard Data follow:

Specimen	AW	PW	SB	ASB	PSB	AP	AM	AL	PL	S
Type	70	86	28	35	41	30	48	40	59	72
508–1	69	90	25	35	39	29	46	44	62	83
508–2	70	89	28	35	36	26	41	39	57	75
508–4	72	91	26	35	36	31	48	35	58	76
540–2	67	79	26	28	29	25	35	29	47	.....
Mean	70	87	27	34	36	28	44	37	57	77

Setæ: Dorsal and ventral setæ similar to scutal setæ about 40 to 50 microns long. Dorsal setæ irregularly arranged. A pair of humeral setæ present followed by an irregular band of about 16 setæ, behind these anterior dorsal setæ there are about 40 posterior dorsal setæ. The ventral setæ are arranged in more definite rows than the dorsal setæ but they are also too irregular to permit a setal formula. Two pairs of sternal setæ in all eight specimens examined but the type is unusual in that it bears an extra median seta between the first pair of sternal setæ. Posterior to the last pair of coxæ there are about 40 setæ arranged in irregular rows.

Material: Collected by O. P. Pearson at Caccachara, 50 miles S.W. of Ilave, Peru, at an altitude of 16,000 feet.

O. P. Pearson's #	*Host*	*Date*	*Number of Specimens*
508	*Phyllotis boliviensis*	28 September 1946	5
540	*Phyllotis darwini*	5 October 1946	2 + Type (MCZ No. 3029)

Diagnosis: As mentioned under the discussion of *Trombicula pearsoni*, *T. biops* is morphologically similar to it. *T. biops* can be separated from *T. pearsoni* on the shape

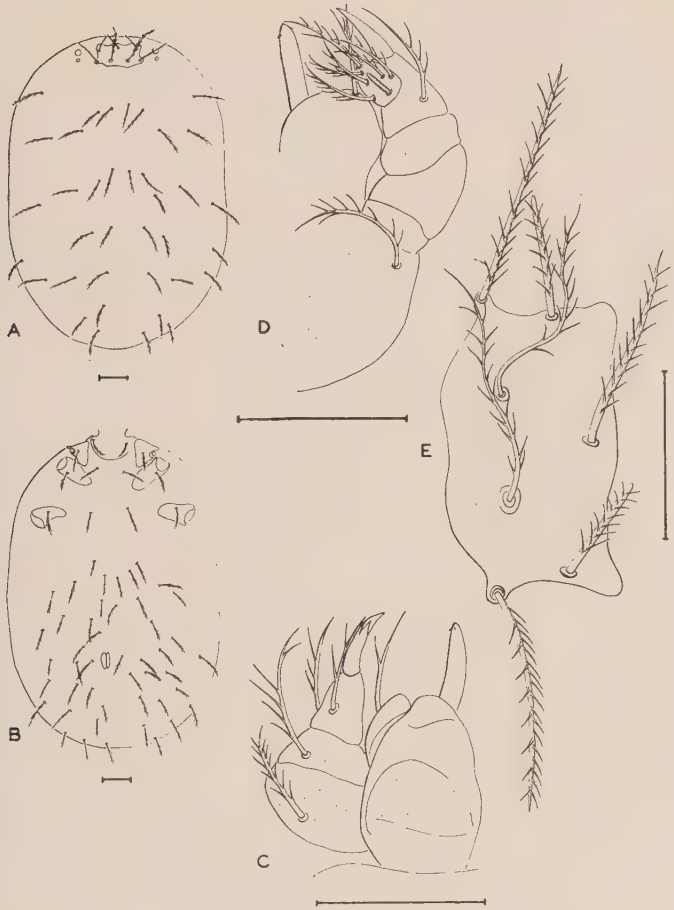


Fig. 4. *Trombicula chara* n. sp. A, dorsum; B, venter; C, dorsal view of gnathosoma; D, ventral view of gnathosoma; E, scutum. (Magnification of each figure, indicated by the line associated with the figure, represents 50 microns.)

of the scutum, absence of ocular plates, size of the subterminalæ, and arrangement of the body setæ as well as by the difference noted under the discussion of *T. pearsoni.*

Remarks: The sensory setæ and sensillæ of this species are so different from those of other species that have been studied in this respect, that it is difficult to know just how *T. biops* is related to other species.

Trombicula chara n. sp.
Figure 4

Body: An enlongated regular oval 625 microns long by 400 microns wide. Striæ weak. Eyes distinctly separate; anterior eyes 8 microns in diameter, posterior eyes 6 microns. Anus ventral and relatively far anterior, 170 microns from the posterior end.

Gnathosoma: Chelicerae with rounded basal segments, and short strongly curved distal segments each of which terminates in a typical tricuspid cap. Palpal segments 1 and 2 with feathered setæ; segment 3 with a branched seta; the three setæ on segment 4 branched, palpal claw with two subequal dorso-lateral tines and a longer median ventral prong; segment 5 with a basal spur and seven feathered setæ, one dorsal, two apical, and four ventral. Galeal seta branched. No stigmata or tracheæ present.

Legs: Coxæ I and II contiguous, coxa III separated by its own length from coxa II. All coxæ with a single feathered seta. Leg I with three genualæ, one microgenuala, two tibialæ, one microtibiala, one spur, one microspur at the tip of the spur, one subterminala and one parasubterminala arising from the same base, and one pretarasala. Leg II with one genuala, two tibialæ, one spur, and a pretarsala. Leg III with one genuala, one tibiala, and one mastitarsala. All legs terminate in a pair of claws and a median claw-like empodium.

Scutum: Irregularly shaped with a sinuous posterior margin. Punctæ scattered over entire scutum except on anterior lateral angles. Pseudostigmata simple pits. Sensillæ filiform with many branches extending almost to their base Scutal setæ with numerous barbs that arise from one face. Anterior lateral setæ set back from the anterior lateral margins of the scutum. The Standard Data follow:

Specimen	AW	PW	SB	ASB	PSB	AP	AM	AL	PL	S
Type	72	83	28	32	17	20	55	35	69	76
508–1	72	79	30	28	15	21	54	36	70	76
540–1	76	87	30	30	18	21	55	33	72	71
540–6	72	87	30	28	18	19	41	35	62	..
540–9	75	83	30	30	18	19	55	32	69	72
Mean	73	84	30	30	17	20	52	34	68	74

Setæ: The dorsal and ventral setæ are similar to the scutal setæ. The dorsal setæ are about 60 microns long while the ventral setæ are about 50 microns. The dorsal setæ are arranged in fairly regular rows. The type has a dorsal setal formula as follows: 2–8–9–6–6–4–2. The other specimens have a less regular arrangement that begins 2–10. The ventral setæ consist of two pairs of sternals and about fifty setæ posterior to coxæ III.

Material: All specimens were collected by O. P. Pearson at Caccachara, 50 miles S.W. of Ilave, Peru, at 16,000 feet.

O. P. Pearson's #	*Host*	*Date*	*Number of Specimens*
508	*Phyllotis boliviensis*	28 September 1946	4
540	*Phyllotis darwini*	5 October 1946	11 + Type (MCZ No. 3028)

Diagnosis: Trombicula chara can be readily recognized from previously described species of Trombicula in that it lacks a pentagonal scutum but does have a mastitarsala on leg III.

Remarks: The types of *T. chara* and the other new species described, as well as half of the other specimens, will be returned to the Museum of Comparative Zoölogy at Harvard. One specimen of *Euschöngastia phylloti, Trombicula biops,* and *Trombicula chara* will be sent to the U. S. National Museum; a similar series will be deposited at the U. S. Public Health Laboratory in Hamilton, Montana; one specimen of *Euschögastia phylloti* and one of *Trombicula chara* will be sent to the South Australaian Museum; and the remainder will be retained at Duke University.

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A PERMIAN INSECT FROM TEXAS

By F. M. Carpenter
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The specimen described below was sent to me several years ago by Mr. Charles B. Read, of the U. S. Geological Survey, who found it in a collection of fossil plants. Although insects have previously been reported from the Permian beds of Texas, this is the first to be formally described. The fossil represents a new species and genus of the Order Protorthoptera.

Family Ideliidæ

This family is known by three genera, *Idelia* Zalessky, *Metidelia* Martynov, and *Sylvidelia* Martynov, all from Permian strata of Russia. Related species of the family Lepiidæ occur in the Elmo beds in Kansas, though the family Ideliidæ itself has not yet been found there.

Ideliopsis, new genus

This is related to *Idelia* and *Metidelia,* but the fore wing differs in having distinct cross-veins apically, instead of cellules, and in having the posterior branch of the media anastomosed proximally with CuA.

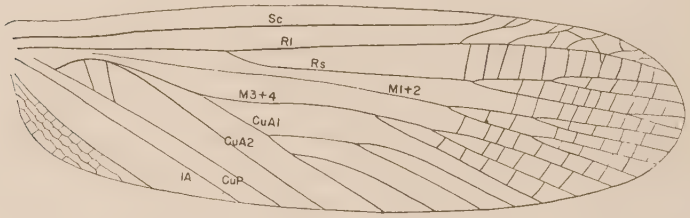
Genotype: *Ideliopsis ovalis,* n. sp.

Ideliopsis ovalis, n. sp.

Figure 1

Fore wing: length, 25 mm.; maximum width, 6 mm. Anterior margin only slightly arched, nearly straight. Rs arises just proximad to the middle of the wing, and has three main branches and a terminal twig on R4 + 5. The base of the media is not preserved, but the anterior branch of M (possibly MA) is unbranched to about the level of the first fork of Rs; it has four terminal branches. The main posterior branch of M (possible MP) is anastomosed with CuA until about the level of the orgin of Rs; it diverges away and terminates in three branches. Cu has

the characteristic form of the Ideliidæ, with a straight and weak CuP, and a well developed CuA. The latter forks shortly after its origin, forming a straight posterior branch (CuA2) and a double-forked CuA1. The anal veins are unbranched and straight or nearly so. Cross-veins are preserved only in the apical part of the wing, where they are numerous and arranged at right angles to the longitudinal veins. There is no indication of cellules, except in the anal area, where the cross-veins are short and close together, much as in *Metidelia*.



Ideliopsis ovalis, n. gen. and n. sp. Fore wing, drawn from holotype. Sc, subcosta; R1, radius; Rs, radial sector; M1 + 2, anterior branch of media; M3 + 4, posterior branch of media; CuA, anterior branch of cubitus; CuP, posterior branch of cubitus; 1A, first anal vein.

Holotype: No. 112018, U. S. National Museum, Washington, D. C.; collected 2½ miles south-east of Fulda, Texas, in Castle Hollow.[1] The specimen consists of a nearly complete anterior wing and fragments of the other wings. The insect has been flattened to such an extent that convexities and concavities of the veins are weakly indicated at most. The rock containing the fossil is a bluish-gray, friable clay-shale. Horizon: Lower Permian (Belle Plains Formation, Wichita Group).

Ideliopsis seems to fit more readily into the family Ideliidæ than into the related Lepiidæ. All known species of the latter family, which is represented in the Lower Permian beds of Kansas, have a less strongly arched CuA. Additional specimens of these two families may show that they are really inseparable. All the described Lepiids

[1] This locality is mentioned by David White, 1912, Proc. U. S. Nat. Mus., 41: 495.

and Ideliids have a net-work of cross-veins covering the entire wing, and all have the posterior branch of M independent of CuA. The conclusion that these two veins are partially anastomosed in *Ideliopsis* has been reached by comparison with *Metidelia* and *Idelia.* In both of these, the media has a long posterior branch and CuA has two main branches. In *Ideliopsis,* M appears to lack the long posterior branch and CuA appears to have an extra anterior branch. It seems probable, therefore, that the posterior branch of M has become attached to CuAl.

The stratum which yielded *Ideliopsis* is apparently about the same age as the insect beds near Elmo, Kansas. At any rate, the Belle Plains Formation of Texas, in which the specimen of *Ideliopsis* was found, has tentatively been correlated with the Wellington Formation of Kansas, of which the Elmo limestone is a member.[2] C. B. Read (in King, 1939, p. 697) has referred to the plants of the Belle Plains Formation as a "Gigantopteris assemblage." David White, who published a list of the plants of the Formation,[3] noted the occurrence of insects in the main plant bed, 4½ miles southeast of Fulda, though he did not mention their being found at Castle Hollow. In 1932 I searched for insects at both localities for several days, but without success.

[2] A. S. Romer, 1935, Bull. Geol. Soc. Amer., 46: 1597–1658 (esp. fig. 3). P. B. King, 1939, Bull. Amer. Assoc. Pet. Geol., 26: 535–763.

[3] David White, 1912, Proc. U. S. Nat. Mus., 41: 506.

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The March, 1948, PSYCHE (Vol. 55, No. 1) was mailed June 30, 1948.

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